June 25, 1996 F/NW03

TO: F/NW - Will Stelle

THROUGH: F/NW03 - Elizabeth Holmes-Gaar

FROM: F/NW03 - Steve Landino

SUBJECT: Anadromous Salmonid Unlisted Species Analysis and Findings for the Plum Creek Timber Company's Habitat Conservation Plan and Unlisted Species Agreement

This memorandum analyses the effects of Plum Creek Timber Company's Habitat Conservation Plan and Unlisted Species Agreement, on the anadromous salmonids resident to their land ownership. The analysis considers the same elements that would need to be considered under sections 7 and 10 of the Endangered Species Act, if these anadromous salmonids were listed.

As indicated in this analysis, this HCP meets the requirements of the statute and the regulations, and further, will result in a positive contribution to anadromous salmonid conservation. Based on this analysis, I recommend that you sign both the Record of Decision for the Final Environmental Impact Statement, and the Implementing Agreement associated with this HCP.

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I. Background

This document constitutes the National Marine Fisheries Service's (NMFS) biological opinion and findings in accordance with sections 7(a)(2) and 10(a)(2)(B) of the Endangered Species Act of 1973 (ESA), on the issuance of an unlisted species agreement to Plum Creek Timber Company, L.P., (Plum Creek), based upon the Habitat Conservation Plan (HCP) and Implementation Agreement (IA). Though the anadromous salmonids that are addressed in the Plum Creek HCP are currently unlisted at this time, and thus not protected under the ESA nor subject to the provisions of sections 7 and 10, the NMFS has agreed to grant an incidental take permit to Plum Creek when and if these anadromous species become listed in the future. This document provides the rationale and biological basis for making that decision, structured by the administrative requirements of sections 7 and 10.

Based on this HCP, the U.S. Fish and Wildlife Service (Service) is issuing a section 10(a)(1)(B) incidental take permit to Plum Creek for the northern spotted owl; the marbled murrelet; the grizzly bear; the gray wolf; the bald eagle; and the peregrine falcon. The proposed IA between Plum Creek, the Service, and the NMFS includes an unlisted species agreement for all vertebrate species which may be found in the habitats which occur in the Planning Area. The Service has completed an analysis of the effects of this HCP on the fish and wildlife species under their jurisdiction.

Over the last 2 years, the Service and NMFS (together the Services) provided technical assistance during the HCP development and cooperated in the preparation of an Environmental Impact Statement (EIS). On September 11, 1995, the Services received a completed application package. Upon completion of review and revision of draft documents, distribution to interested parties was initiated and a Federal Register notice was published on November 17, 1995 (60 FR 57722) which announced the release of the draft HCP and draft EIS to the public. An additional Federal Register was published by the EPA announcing the availability of the DEIS on November 24, 1995. The comment period was scheduled to close on January 8, 1996; however, on January 4, 1996, (January 17, 1996; 61 FR 1193) the comment period was extended until January 22, 1996.

The Services addressed concerns raised about the Plan and discussed alternative approaches with Plum Creek. Upon completion of these discussions, the Service prepared a Final Environmental Impact Statement, including the changes made to the HCP and IA.

This analysis is based on information provided in the Habitat Conservation Plan, the Final Environmental Impact Statement, technical papers prepared to support the HCP, and various other documents cited later in this document and listed in the Literature Cited Section. A complete administrative record on this consultation is on file in the Fish and Wildlife Service's Western Washington Office.

II. Project Description

Plum Creek has applied to the Service for an incidental take permit under section 10(a)(1)(B) of the Act and has also requested that the Services enter into an unlisted species agreement to conserve currently unlisted fish and wildlife species which may be associated with habitats on their properties in the Planning Area in exchange for assurances, barring extraordinary circumstances, that those species would be added to the permit upon listing of any such species. Plum Creek proposes to manage these lands pursuant to the HCP and IA that were developed as part of their permit application. The term of the proposed HCP and the proposed permit is 50-100 years. Some aspects of the HCP and IA may terminate at year 50 (Phase I) while others (Phase II) may continue for an additional 50 years. The HCP and IA allow for the possibility of early termination of the permitted activity or amendment of the subject documents.

In addition to the HCP, the application package consists of an Implementation Agreement (IA) (Plum Creek Timber Company, L.P. and U.S. Fish and Wildlife Service 1995-6). A Draft Environmental Impact Statement (DEIS) (U.S. Fish and Wildlife Service 1995) and Final Environmental Impact Statement (FEIS) were prepared in compliance with the Service's NEPA responsibility. The IA describes the responsibilities of the Applicant and the Services. The term of the permit and HCP implementation would be 50 years in a first phase with the possibility of an additional 50 year second phase if certain specific conditions exist at the end of the first 50-year phase. The IA provides for termination of the HCP by either party provided that mitigation in accordance with the requirements of the Act will be provided for any take that has occurred to that point. If a dispute exists regarding the extent of any incidental take/mitigation inequities upon termination, either party may avail themselves of mediation or alternative dispute resolution.

Location: The subject ownership occurs in a checkerboard pattern in an area commonly referred to as the Interstate-90 (I-90) Corridor. The term checkerboard refers to alternate sections of public and private land. The outer boundaries of the planning area encompass 418,690 acres. Because of the checkerboard configuration of land ownership, the area includes 249,513 acres of other ownership. Plum Creek's ownership in the Planning Area is generally intermingled with Federal lands, and consists of 169,177 acres of alternating sections (1 square mile) of Plum Creek lands bordered, mainly, by Federal lands administered by the Forest Service.

Plum Creek's ownership within the Planning Area is located both east and west of the Cascade Mountain crest along the I-90 corridor in central Washington, between 60 to 100 miles east of

Seattle. The predominant non-federal land use in the I-90 corridor and surrounding areas is commercial timber production. Federal lands are managed for multiple uses, but timber harvest has traditionally been one of the most significant land uses that has affected wildlife habitat.

Summary of HCP Actions: The HCP, which is incorporated herein by reference, proposes a fully developed management scheme designed to minimize and mitigate impacts from any expected incidental take of the listed species named above. Furthermore, the HCP addresses all unlisted anadromous salmonid species in the Plan Area by addressing their habitat requirements, and minimizing, mitigating and monitoring the impacts of the HCP to these fish species.

The HCP is a programmatic-style plan for Plan Area management. Individual management units are not scheduled for harvest at any particular time and individual road locations and management are not specified. The plan focuses on timber management as the primary landscape influencing factor and the factor with the most influence species covered in the plan.

Measures to be implemented by Plum Creek to minimize and mitigate effects of incidental take of species are summarized in Section V. A below, and fully described in the HCP (PCT, 1996b).

III. Biological Information

Anadromous salmonids were historically found throughout the HCP planning area which is naturally divided by the Cascades crest, creating two major river basins. These are the Green River and Yakima River, and both have different histories of anadromous salmonid occupation and exploitation (PCT, 1996b; Watson and Toth, 1995; USDC and USDI, 1996). Due in large part to vast differences in the distance to the ocean, anadromous salmonids in these drainages had naturally evolved different life histories, including disparate run timings. However, multiple human induced factors have contributed to strongly influence the present day distribution of anadromous salmonid species, included among them are the creation of migration blockages (dams, diversions, etc.), in-river and ocean harvest, and estuarine and freshwater habitat alteration. These limiting factors were analyzed in preparation of the PCT HCP, by Watson and Toth (1995) and are included herein by reference. The present day anadromous salmonid distribution reflects these natural and human induced factors, and the HCP was designed to conserve these species and life history types. The general life history and habitat requisites for chinook and coho salmon, and steelhead trout is summarized in section 2 of the HCP (PCT, 1996b) and is incorporated herein by reference. The status of each of these anadromous salmonid species is analyzed below by drainage, beginning with the Yakima River and followed by the Green River.

A. Yakima River Drainage

The Yakima River is a major tributary to the Columbia River, located upstream from it's confluence with the Snake River (see PCT, 1996b for river location and species distribution information). Thus, as mentioned above, dams have played a fundamental role in shaping the

health of the remaining fish stocks. The two extant anadromous salmonid species are the chinook salmon *(Oncorhynchus tshawytscha)* and summer steelhead *(O. mykiss)*. Native coho salmon *(O. kisutch)*, have been extinct from the Yakima River since 1984 (Watson and Toth, 1995; YIN et. al., 1990) so they will not be considered further in this analysis.

1. Chinook Salmon

There were three run timings for chinook (spring, summer and fall) in the Yakima River, and all run timings occurred in large numbers (PCT, 1996b; YIN et. al., 1990). All life history types have declined dramatically in population numbers from historic numbers and are considered depressed (WDF & WDW, 1993). Typically, chinook utilize lower gradient streams (0 to 4 percent), of which there are about 130 miles in the Yakima system within the HCP area. Spring chinook tend to spawn in large tributaries, while summer and fall run chinook tend to be mainstem spawners. Spring chinook spawning in the HCP area is limited to the upper Yakima R., Cle Elum R. and the Little Naches R. (PCT, 1996b). Currently, spring chinook are found in highest abundance of the three run timings, and yet this stock is at very low numbers compared to historic levels (see PCT, 1996b for a description of chinook status and decline).

West coast chinook are currently under evaluation by a biological review team assembled by the National Marine Fisheries Service (NMFS) to determine if they warrant protective status under the Endangered Species Act of 1973. More information on the status of chinook in the Yakima River will become available upon completion of the NMFS status review which is due in 1997. Because chinook are subject to a status review for a possible ESA listing, they are considered a "candidate" species for the purposes of this analysis.

2. Steelhead Trout

Steelhead, the anadromous form of rainbow trout, were historically distributed throughout the Yakima River and it's tributaries. Yakima River steelhead are summer run, that is they enter the river in a sexually immature condition throughout the summer and mature in freshwater to spawn later in the following winter and spring. Spawning summer steelhead typically utilize higher gradient and smaller tributaries than do chinook salmon. Thus, most permanently flowing waters without natural blockages historically had steelhead, and they occurred in high numbers (up to 100,000) throughout the Yakima River (WDF & WDW 1993). There are approximately 218 miles of fishbearing streams in the Yakima River throughout the HCP planning area. Steelhead could occupy all these areas, but currently spawn in 3 areas, the mainstem Yakima R., West Fork Teanaway R. and perhaps Big Creek. (PCT, 1996b). Currently, summer steelhead are at very low numbers in the Yakima River and throughout the HCP area (see PCT, 1996b for a description of steelhead status and decline), and are considered depressed (WDF & WDW, 1993). In addition to habitat associated risk factors, Yakima summer steelhead may be affected by genetic introgression from hatchery reared steelhead, though information is uncertain at this time (WDF & WDW, 1993).

West coast steelhead are currently under evaluation by a biological review team assembled by the National Marine Fisheries Service (NMFS) to determine if they warrant protective status under the Endangered Species Act of 1973. More information on the status of steelhead in the Yakima River will become available upon completion of the NMFS status review which is due in fall 1996. Because steelhead are subject to a status review for a possible ESA listing, they are considered a "candidate" species for the purposes of this analysis.

B. Green River Drainage

The Green River is located on the west side of the Cascade crest and drains into Puget Sound (see PCT, 1996b for river location and species distribution information). The drainage historically supported large numbers of chinook salmon, coho salmon *(O. kisutch)* and steelhead trout. As with the Yakima drainage, dams have shaped current species distribution (Watson and Toth, 1995; PCT, 1996b). The Howard Hansen Dam presently blocks upstream passage for all anadromous salmonid species, but small numbers of steelhead are trucked and released into the upper watershed annually.

1. Coho Salmon

Coho likely occupied most fish bearing streams in the HCP area without natural blockages. Presently, due to past and current plantings of juvenile coho, their current distribution above Howard Hansen Dam is unknown. Coho typically occupy lower gradient streams (0 to 4 percent), but can occupy higher gradients as well (USDC & USDI, 1996). There are 40 miles of fish bearing waters in the Green river throughout the HCP area that, absent the dams, would otherwise be available to coho. Green River coho are part of the Puget Sound/ Strait of Georgia Evolutionarily Significant Unit (ESU). There have been extensive plantings of non-native hatchery coho throughout the Green River drainage, and these non-native coho have likely interbred with Green River coho which may have affected the stocks genetic integrity (Weitkamp et.al., 1995). This ESU has been proposed as a "candidate" for listing under the ESA, pending further analysis of additional information (60 F.R. 38011, July 25, 1995).

2. Steelhead

Steelhead were historically distributed throughout the Green River and it's tributaries. Green River steelhead are winter run, that is they enter the river in a sexually mature condition in winter and spawn shortly thereafter. Spawning steelhead typically utilize rivers and streams at gradients of 1 to 10 percent. Rearing juvenile steelhead use streams with less than 25 percent gradient. Thus, most permanently flowing waters without natural blockages historically had steelhead in the Green River. There are about 71 miles of streams with 0 to 10 percent gradient in the upper Green River. There are approximately 135 miles of fishbearing streams in the Green River throughout the HCP planning area. Steelhead could occupy all these areas. Fry plantings have occurred in the Green R. since 1982, and adults have been trucked in low numbers (about 50 individuals/year) above the dams since 1992 (Watson and Toth, 1995; USDC & USDI, 1996).

Green River steelhead may be affected by genetic introgression from hatchery reared Chambers Creek stock that are planted annually, though fishery managers believe their spawning is temporally isolated (WDFW & WWTIT, 1994).

West coast steelhead are currently under evaluation by a biological review team assembled by the National Marine Fisheries Service (NMFS) to determine if they warrant protective status under the Endangered Species Act of 1973. More information on the status of steelhead in the Green River will become available upon completion of the NMFS status review which is due in fall 1996. Because steelhead are subject to a status review for a possible ESA listing, they are considered a "candidate" species for the purposes of this analysis.

3. Chinook Salmon

Though they once occupied the Green River above Howard Hansen Dam (PCT, 1996b), fall chinook salmon are currently not known to exist in that section of the Green River and are considered extirpated. There is some chance they will be re-introduced in the future. Chinook typically occupy low gradient streams of 0 to 4 percent, and there are 40 miles of such habitat in the Green River drainage in the HCP area. A healthy population (increasing trend) composed of naturally spawning and hatchery reared chinook occurs downstream of the dam (WDFW & WWTIT, 1994).

West coast chinook are currently under evaluation by a biological review team assembled by the National Marine Fisheries Service (NMFS) to determine if they warrant protective status under the Endangered Species Act of 1973. More information on the status of chinook in the Green River will become available upon completion of the NMFS status review which is due in 1997. Ordinarily, because chinook are subject to a status review for a possible ESA listing, they would be considered a "candidate" species for the purposes of this analysis. However, because they are a composite stock below the Howard Hansen Dam and functionally extinct in the upper Green River with passage prevented by the dam, they will not be considered further here.

IV. Environmental Baseline

The environmental baseline for the anadromous salmonid species that inhabit the area covered by the HCP, includes the past and present impacts of all Federal, State, or private activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process (50 CFR 402.02). As stated earlier, all anadromous salmonid species analyzed herein are presently unlisted, so there have not yet been section 7 consultations. This analysis will focus on the past and present impacts of all Federal, State, or private activities in the HCP area.

A. Limiting Factors

A limiting factor analysis for anadromous salmonids that occupy the HCP planing area was prepared by PCT in advance of the HCP (Watson and Toth, 1995), and is summarized in the HCP (PCT, 1996b). The primary factors contributing to the decline of anadromous salmonid stocks in the Yakima and Green River drainages include:

1) degradation and loss of spawning and rearing habitat resulting from many activities including timber harvesting, agriculture, road construction, urban development, and water withdrawals;

2) over-exploitation in ocean and freshwater fisheries;

3) migratory impediments such as dams and water diversions.

These factors are addressed in detail in Watson and Toth (1995) summarized in USDC & USDI (1996) and PCT (1996b), and are incorporated herein by reference. To briefly summarize, the primary causes of salmonid population declines in the HCP area are dams, agricultural practices, habitat modifications from a variety of activities, and over fishing.

Past forest practices have contributed to the current legacy of degraded conditions of instream and riparian habitats. The Green River and Yakima River drainages are no exception. Excessive harvests in the riparian zones, logging of unstable slopes, and inadequate road building have all contributed to this situation (PCT, 1994; 1996a).

1. Yakima River Drainage

Though significant factors both inside and outside the HCP area impact anadromous salmonids , once they reach their natural spawning areas within the HCP area, they are subject to the existing habitat conditions of the ownership. Habitat quality for anadromous salmonids has been and is being assessed through the watershed analysis process, as practiced by Plum Creek (Toth, 1995). Instream and riparian habitats within HCP area are variable - but are in general degraded. The Quartz Mountain watershed analysis examined factors affecting Taneum Creek. The most pervasive problem in the watershed was excessive fine sediment. This can negatively impact spawning habitat and reduce the quality of winter rearing habitat. Watershed analysis prescriptions were focused on ameliorating these habitat conditions (for details, see PCT, 1994).

2. Green River Drainage

Currently, fish habitat in the upper basin above Howard Hansen Dam is degraded. Past logging practices, including inadequate road building and harvesting on steep slopes, contributed to these degraded conditions (PCT, 1996a). One watershed analysis has been completed to date in the Green River drainage (the Lester in March 1996). For a complete description of the conditions

in this watershed and resulting prescriptions designed to improve conditions and avoid potential problems in the future, see PCT (1996a). In other areas of the drainage, recent stream surveys have indicated low pool frequency, pool quality, lack of adequate cover, a general lack of riparian vegetation, and a low number of stable side channels. These conditions have created unstable conditions for successful anadromous fish reproduction - including redd scour even during moderate flow events.

B. Federal Land Management

The Plum Creek HCP area is a checkerboard pattern interspersed with U.S. Forest Service lands (for details, see Chapter 1 of the HCP (PCT, 1996b)). Though Forest Service Lands are managed for multiple uses, timber harvest is one of the primary activities that will occur into the future. In the Pacific Northwest, these federal forests are managed in accordance with the Record of Decision (ROD) (USDA, USDI, BLM, 1994). Details on how the HCP and interacts with the adjacent Federal lands can be found in Chapters 1 and 2 of the HCP (PCT, 1996b). Under the ROD, riparian areas will be managed in accordance with the Aquatic Conservation Strategy (USDA, USDI, BLM, 1994), which sets up a system of riparian reserves, key watersheds, watershed analysis, and watershed restoration. The streamside protection within the riparian reserves is summarized as follows:

- Fishbearing streams - two site potential tree height buffers, or 300 feet slope distance, on each side of the stream, whichever is greater;

- Perennial nonfishbearing streams - one site potential tree, or 150 feet slope distance on each side of the stream, whichever is greater;

- Intermittant streams - one site potential tree, or 100 feet slope distance on each side of the stream, whichever is greater;

Buffers are also established for lakes, ponds, and wetlands. Also, management strategies differ depending on whether a watershed is "key" or "non-key" (for more details, see USDA, USDI, BLM, 1994)

This strategy for riparian management will undoubtably improve riparian and instream fish habitats on federal lands, and greatly assist in restoring instream habitat features on the adjacent HCP ownership.

V. Elements of the Habitat Conservation Plan

The HCP was built upon a Riparian Management Strategy and watershed protection strategy (Toth, et. al., 1995), that was designed to both protect instream habitat for anadromous and resident fish, but to also maintain streamside habitat for wildlife species. The Riparian Management Strategy includes 5 major components:

1) Forest Practice Rules and Regulations

2) Watershed Analysis

3) Riparian Habitat Protection

4) Harvest Deferrals

5) Aquatic Resources Monitoring

A complete description of the goals and objectives of each of these strategies is in section 3 of the HCP (PCT, 1996b). A brief summary of specific conservation measures is provided below.

A. Conservation Measures in the Plan for Fish and Fish Habitat

1. Riparian Management

PCT will complete a hierarchal ecological classification of the Planning Area which incorporates geomorphology and hydrologic data necessary for watershed analysis (Jensen 1995; Section 2.1). PCT will accelerate the watershed analysis process in 20 watersheds in the Planning Area. As of this writing, they have completed 3 analyses, Quartz Mountain and Alps (Yakima R. drainage) and Lester (Green R. drainage) and 6 are in progress. Evaluations, subject to SEPA review, will be submitted within 5 years following issuance of the Permit. Watershed analysis and aquatic habitat monitoring will provide feedback into riparian strategies through adaptive management, and the resulting prescriptions will be modified as necessary. PCT will manage 10,900 acres of forest adjacent to perennial streams according to Forest structural classes projected in Table 30.

2. Riparian Habitat Areas (RHAs)

The minimum and interim widths and restrictions are as follows:

1. Fishbearing Streams -- Maintain 200-foot Riparian Habitat Areas (RHA) with 30-foot, no-harvest/no-equipment zone. Harvests may remove up to 50 percent of volume only when consistent with retention of characteristics needed for FD habitat for owls, and in accordance with the specifications for stand structural stages in Table 30. Retained timber will be "feathered" (i.e., more trees left near stream). Yarding will be avoided across fishbearing streams as much as possible.

2. East Side Sensitive Perennial Nonfishbearing Streams -- Identify perennial nonfishbearing streams upstream of bull trout, salmon, or 303(d) listed waters, or below 5,000 feet in Late-Successional Reserves (LSR) or Adaptive Management Areas (AMA). Establish 100-foot RHA with an interior 30-foot no land based equipment buffer. Harvests may remove up to 50 percent of volume only when consistent with retention of characteristics needed for foraging and

dispersal habitat for owls. Retained timber will be "feathered" (i.e., more trees left near stream). Yarding corridors will be limited to 15-20 percent of the stream reach.

3. West Side Perennial Streams -- Establish 25-foot Riparian Leave Tree Areas (RLTA's) along perennial streams for the first 2,000 feet or more from a junction with a fishbearing stream. Also establish RLTA's in clumps along any other perennial streams. Other perennial streams not discussed above may not receive a buffer unless they occur on unstable slopes, inner gorges, or other areas identified for special treatment in watershed analysis.

4. Intermittant Streams -- Intermittant streams that occur in areas prone to landslides will receive protection as determined through watershed analysis.

Harvest Deferrals on 303(d) Listed Streams -- In addition, Plum Creek will defer harvest on 667 acres of riparian forest adjacent to stream segments listed as water-quality limited until completion of watershed analysis. Plum Creek will also identify and monitor stream reaches in key watersheds on Plum Creek land to evaluate aquatic habitat conditions and fish populations at periodic intervals over the Permit Period.

3. Watershed Analysis

As mentioned above, PCT will use an enhanced form of Washington State's Watershed Analysis as a key component of their fish conservation strategy (Toth, 1995). A brief description of the elements of watershed analysis and how it will be used in the HCP appears in section 3 of the HCP (PCT, 1996b). Key components incorporated by PCT in their watershed analysis process include, measuring the RHA's from the outer edge of the channel migration zone, adopting interim and minimum RHA's on fishbearing streams, and agreeing to implement the otherwise voluntary monitoring module from State watershed analysis. Also, in accordance with watershed analysis, a Road Maintenance and Abandonment plan will be implemented. Some of the measures to reduce the effects of roads to anadromous fish resources, are found in section 3 of the HCP (PCT, 1996b).

4. Monitoring and Adaptive Management

Monitoring and Reporting: Under the HCP, PCT will monitor key criteria annually for the Permit Period and provide reports to the Services at years: 2, 5, 10, 15, 20, 30, 40, and 50, and at 10-year intervals during Phase II. The complete schedule of monitoring and reporting is presented in HCP Table 31 (PCT, 1996b). Monitoring of importance to anadromous species will include the following types: Implementation monitoring, Habitat monitoring through watershed analysis, Aquatic Monitoring (including effectiveness, water temperature, invertebrate indicators, and fish populations. A complete description of the aquatic monitoring protocols is in section 5 of the HCP (PCT, 1996b).

The results of watershed analysis process and the aquatic monitoring strategy will provide a

feedback loop that can modify prescriptions of the HCP. Thus, if the results of either process indicate a more conservative approach to riparian management is warranted, the new information will be used and new management prescriptions will be implemented.

B. Effects to Fish Species

The proposed HCP has been specifically designed to protect instream fish habitat and maintain healthy riparian habitats. Anadromous salmonids are present throughout the Yakima drainage, even after severe habitat alterations, blockages to migration and excessive harvests. The conservation measures identified above (section V), will increase the quantity and quality of instream and riparian habitat throughout the course of the HCP period. Currently marginal or degraded riparian stands will grow into properly functioning habitat, because the RHA strategy for fishbearing streams will provide a site-potential tree height managed buffer that will provide needed shade, nutrient input, bank stability and large woody debris (LWD). In the Yakima drainage, increased protection on perennial non-fishbearing streams will result in healthier riparian stands that will be able to also contribute LWD, that will function to store excess sediment and minimize effects to downstream fishbearing waters. These factors in conjunction with watershed analysis prescriptions assure that spawning and rearing habitat will increase in the HCP area. Increases in LWD due to the RHA's will create deeper pools for returning adults and summer rearing juveniles, more hiding cover for juveniles, and more habitat complexity for winter rearing juveniles. Thus, the conservation measures in this HCP will most likely increase the productive potential of anadromous salmonids in the HCP area.

C. Effects on Fish Habitat

Though instream habitat and riparian conditions are generally degraded throughout the HCP area, the measures taken in this HCP will help to restore instream and riparian habitat across the PCT ownership. Specifically, the RHA's on fishbearing streams will provide for the growth and development of a properly functioning riparian zone, that will provide over the life of the HCP the following riparian functions - sufficient shade, bank stability, litter inputs for healthy nutrient supply, and a continual source of LWD for instream structural elements important to fish Watershed analysis will put in place appropriate prescriptions to minimize sediment inputs due to landslides, minimize the frequency of peak flows associated with timber harvest, assess the condition of fish habitat and riparian stands, and monitor the effects of forest practices on aquatic habitat. Also, in accordance with the road maintenance and abandonment plan, watershed analysis prescriptions will reduce road generated sediment to aquatic resources and remove any culverts blockages to fish passage. The aquatic monitoring strategy will test assumptions made in some of the watershed analysis prescriptions, as well as monitor additional variables. Because these elements form the basis of adaptive management in this HCP, the incorporation of new information and the ability to change management strategy is assured. This flexibility is key to assuring this HCP will improve conditions for anadromous salmonids in the HCP area.

D. Indirect and Cumulative Effects

Indirect effects are those that are caused by the action and are later in time but still relatively certain to occur (50 C.F.R part 402.02). The action in this context is the issuing of an unlisted species agreement for anadromous salmonids, with provisions to grant the applicant, Plum Creek Timber Co., an incidental take permit under section 10(a)(1)(B) of the ESA when and if any of these anadromous salmonids are listed. This plan is for 100 years (including phase I and II), so all effects analyzed are considered as direct effects. Cumulative effects are those effects caused by other projects and activities unrelated to the action under consideration, the most relevant of these effects are problems associated with fish passage to and from the ocean in the HCP planning area, and land management on state, private (i.e. non-Federal) land and Federal land adjacent to the HCP area. One effect in this category would be increased fishing pressure brought on by increased salmonid productivity resultant from the HCP. Increased angling pressure could result in habitat modification deleterious to fish habitat due to trampling. It is expected that state regulations will adjust to changing numbers of anadromous salmonids and respond to habitat conditions as needed or appropriate. It is also anticipated that other non-Federal activities will continue at the same level as in the past. Considering the possible cumulative effects to anadromous salmonids, the conservation measures identified in this HCP either minimize, or mitigate these effects to the maximum extent practicable. Habitat for sensitive life stages of anadromous salmonids will be increased by the measures identified in this HCP.

VI. Findings

Though anadromous salmonids addressed in the HCP are not listed under the ESA at this time, this document is intended to provide Plum Creek Timber Company, assurances that they will receive an Incidental Take Permit if and when such species are subsequently listed. Thus, NMFS make the following findings with regard to the adequacy of the HCP meeting the statutory and regulatory requirements for such an Incidental Take Permit under Section 10 (a) (2) (B) of the ESA and 50 CFR 222.22 (c)(2).

1. The taking of listed species will be incidental. Activities that will occur in the HCP area that may result in take (if anadromous species were listed) may include "harm" through adverse changes in essential habitat features such as increased peak flows due to upslope harvesting, reduced LWD input due to harvest of riparian trees in some type 5 channels (and type 4 channels on the west side), and additional sediment inputs due to landslides and road use throughout the planning area. Also, take may occur through the "harass" definition as well, by frightening or disturbing spawning fish during riparian yarding, road crossing or riparian management activities. This types of take are speculative and are not quantifiable.

> Any take of anadromous salmonids (steelhead trout, chinook or coho salmon) will be incidental to otherwise lawful forest management and incidental land use activities by Plum Creek Timber Company, L.P., as specified in the HCP, as modified in the FEIS.

2. Plum Creek Timber Company, L.P. will, to the maximum extent practicable, monitor,

minimize and mitigate the impacts of taking chinook, coho or steelhead. Measures in this HCP minimize and mitigate for any take impacts that may occur, through prescriptions generated in watershed analysis (for example - designating no harvest areas on steep unstable slopes), and by the designation of RHA's throughout the HCP area that assure properly functioning riparian habitats for fishbearing streams. Also, PCT will monitor through watershed analysis and aquatic resources monitoring, to test assumptions and to determine effectiveness of prescriptions. Finally, PCT will NOT harvest RHA's beneath conditions described for foraging and dispersal habitat for owls (see PCT 1996b), or in excess of stand structures identified in Table 30 of the HCP, even in phase II of the HCP.

The HCP and IA contain measures to monitor, minimize and mitigate the impact of take of presently listed species under the permit.

3. Based upon the best available scientific information, the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild. Conservation measures identified in the plan will increase the quality and quantity of spawning and rearing habitat in the HCP area, and result in a benefit to anadromous salmonid species.

The Act's legislative history establishes the intent of Congress that this issuance criteria be based on a finding of "not likely to jeopardize" under section 7(a)(2) [see 50 CFR 402.02]. This is the identical standard to Section 10 (a)(2)(B). Thus, the NMFS has considered the status of the species, the environmental baseline and the effects of the proposed action, and any indirect and cumulative effects, to conclude that issuance of the unlisted species agreement (or at some point - the incidental take permit) to Plum Creek would not likely jeopardize the continued existence of the anadromous salmonids addressed in the HCP.

4. The plan has been revised to include any other measures, as required by the NMFS, have been met.

The HCP and IA incorporate all elements determined by the NMFS to be necessary for approval of the HCP and issuance of the permit.

5. The NMFS has received the necessary assurance that the plan will be funded and implemented.

Signing of the IA by Plum Creek assures that the HCP will be implemented. Plum Creek Timber Company, L.P. will ensure adequate funding for the HCP. Also, the HCP and IA commit Plum Creek to adequately fund implementation of the HCP.

VII. Procedures In the Event of Listings

As specified in the IA, should any of the currently unlisted species subsequently become listed, Plum Creek may request an amendment to the incidental take permit to include such vertebrate species. If an amendment request is received, the Service and/or NMFS will reinitiate consultation under Section 7 of the Act and initiate amendment of the HCP. Such an amendment will: (1) present relevant existing information on the status, trend, or other information pertinent to the Planning Area; (2) estimate the amount of take and the impacts of such take; (3) describe the ongoing minimization and mitigation steps the applicant is taking or will take relative to that species; (4) describe any additional actions that were found to be necessary or appropriate to successfully complete an amendment for that species; and (5) explain how each of the issuance criteria described in Section 10 (2)(B) are being met. Such amendment should cite the Federal Register documents used in proposed, emergency, or final listing; cite any pertinent draft recovery plan effort or similar management plans for the species or its habitats; and must consider the other obligations of the Services as Federal agencies. It is expected that, upon listing of a currently unlisted species, additional information will be available in any proposed, final, or emergency listing to determine the habitat and life-history requirements of the species, the range-wide status, threats to the species, applicable management recommendations, and other basic information necessary to complete the amendment and reinitiation processes. Before such species would be added to the permit, the Service must find that adding the species to the permit would not appreciably reduce the likelihood of survival and recovery of the affected species in the wild and would be consistent with its other responsibilities.

VIII. References

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